



ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

MINIMUM REQUIREMENTS DECISION GUIDE WORKBOOK

“...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...”

-- The Wilderness Act of 1964

Project Title: **Helicopter Landings by the Arizona Game and Fish Department within Portions of the Four Peaks, Hellsgate, Mazatzal, Salt River Canyon, and Superstition Wilderness Areas for the Purposes of Bighorn Sheep Management**

MRDG STEP 1

Determine if Administrative Action is Necessary

Description of the Situation

What is the situation that may prompt administrative action?

The Tonto National Forest proposes to authorize the use of helicopters by the Arizona Game and Fish Department within the Tonto National Forest, including landing in designated wilderness areas, for the purposes of bighorn sheep management for a minimum of ten years. Helicopters would be used for capture and translocation of bighorn sheep, to conduct research on bighorn sheep, and to monitor bighorn sheep populations within portions of the Four Peaks, Hellsgate, Mazatzal, Salt River Canyon, and Superstition Wilderness Areas. This action is necessary for the Arizona Game and Fish Department to meet bighorn sheep management objectives and conservation strategies identified in the Arizona Game and Fish Departments (Department) State Wildlife Action Plan (SWAP).

While the SWAP addresses the full array of wildlife and habitats, it focuses on identifying and

managing the wildlife and habitats that are in the greatest need of conservation. The SWAP identifies bighorn sheep (*Ovis canadensis*) as a Species of Greatest Conservation Need. As icons of the Desert Southwest, bighorn sheep are recognized as an important wildlife resource in the State of Arizona and throughout the rest of their natural range. Establishing and maintaining healthy populations of all subspecies of bighorn sheep is the Arizona Game and Fish Department's statewide bighorn sheep management objective. On the Tonto National Forest many of the bighorn sheep populations exist within designated wilderness areas.

Bighorn Sheep Capture and Translocation

In 2009 the Arizona Game and Fish Department surveyed Game Management Unit (GMU) 22 (Four Peaks Wilderness) and GMU 24B (Superstition Wilderness) and determined that both populations were sufficiently large enough to capture bighorn sheep as a source population for translocations. Bighorn sheep surveys within and around the Four Peaks and Superstition Wilderness Areas continue to show a healthy and stable bighorn sheep population. The current bighorn sheep population estimate is 185 bighorn sheep in and around the Four Peaks Wilderness and 184 bighorn sheep in and around the Superstition Wilderness. The Arizona Game and Fish Department has determined the bighorn sheep population in and around the Four Peaks Wilderness and the Superstition Wilderness are of adequate size to capture approximately 30 bighorn sheep every other year to translocate to other parts of the state as determined by the Arizona Game and Fish Department.

Bighorn Sheep Research and Population Monitoring

Research is being conducted to identify bighorn sheep movement, habitat utilization, herd health, subspecies identification, and monitor the bighorn sheep populations within and surrounding the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas in GMU 22, 23, and 24A. Current data and observations indicate that bighorn sheep are likely using travel corridors in and around the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas. Existing Global Positioning System (GPS) collars originally affixed in November 2012 are nearing the termination of their battery life, and the need exists to capture additional bighorn sheep to affix GPS collars and assist in the ongoing research and management of these populations for a minimum of 10 years. Furthermore, bighorn sheep survey and GPS data is being used to assess potential domestic sheep and bighorn sheep disease conflicts near the Heber-Reno domestic sheep driveway that may prompt management actions to prevent or slow the spread of epizootic disease should it be detected.

Options Outside of Wilderness

Can action be taken outside of wilderness that adequately addresses the situation?

☐ YES

STOP – DO NOT TAKE ACTION IN WILDERNESS

☒ NO

EXPLAIN AND COMPLETE STEP 1 OF THE MRDG

Explain:

On the Tonto National Forest, approximately 56 percent (189,325 acres) of occupied bighorn sheep habitat is within designated wilderness areas (Table 1).

Table 1. Percent of Occupied Bighorn Sheep Habitat within Tonto National Forest Designated Wilderness Areas

Tonto National Forest Wilderness Area	Acres of Occupied Bighorn Sheep Habitat Outside of Wilderness	Acres of Occupied Bighorn Sheep Habitat Within Wilderness	Percent of Occupied Bighorn Sheep Habitat Within Wilderness
Four Peaks Wilderness	9,577.23	22,378.84	70.03
Hells Gate Wilderness	158.97	7,671.89	97.97
Mazatzal Wilderness	5,536.89	43,375.54	88.68
Salt River Canyon Wilderness	15,384.77	19,588.57	56.01
Superstition Wilderness	69,570.24	96,310.16	58.06
Parker Creek*	6,673.09	0	0
Total	106,901.19	189,325	56.46

Bighorn Sheep Capture and Translocation

Approximately 70 percent of occupied bighorn sheep habitat in GMU 22 occurs within the Four Peaks Wilderness and approximately 58 percent of occupied bighorn sheep habitat in GMU 24B occurs within the Superstition Wilderness. Some of the bighorn sheep in and around the Four Peaks Wilderness and Superstition Wilderness can likely be captured outside of wilderness, but to obtain a proper distribution of ewes rams, and yearlings for translocation efforts, several bighorn sheep will need to be captured within these wilderness areas. Targeting the limited habitat and populations of bighorn sheep outside these wilderness areas may cause additional stress resulting in adverse health effects to these bighorn sheep. Furthermore, the majority of bighorn sheep survey locations have been documented within wilderness areas indicating that the bighorn sheep are more likely to be located within wilderness than outside of wilderness (Table 2.)

Table 2. Percent of Bighorn Sheep Survey Locations (GPS) within Designated Wilderness

Tonto National Forest Wilderness Area	Number of Bighorn Sheep Survey Locations	Number Of Bighorn Survey Locations within Wilderness	Percent of Bighorn Sheep Survey Locations within Wilderness
Four Peaks Wilderness	122	95	78
Mazatzal Wilderness	9	9	100
Salt River Canyon Wilderness	37	20	54
Superstition Wilderness	164	79	48
Total	332	203	61

Bighorn Sheep Research and Population Monitoring

Additionally, the majority of bighorn sheep survey locations occur in the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas from which the Arizona Game and Fish Department proposes to capture bighorn sheep for research and population monitoring purposes. To successfully achieve these objectives, it is critical that the Arizona Game and Fish Department has the ability to monitor daily activities and confirm sheep movements and mortalities quickly and safely. This includes the efficient capturing of sheep for affixing GPS collars and for the ability to recapture sheep to address GPS collars that are in need of replacement. Normally, GPS data from collars is uploaded to satellites, however, environmental factors such as canopy cover and terrain can negatively affect signal transmission and prevent data upload. If collars fail to upload, the Arizona Game and Fish Department needs to quickly verify and confirm functionality with field visits. The inherent wilderness characteristics of steep terrain, extreme seasonal temperatures, and remote locations provide for habitat for bighorn sheep, but it is these same characteristic that limit the ability of the Arizona Game and Fish Department to meet management objectives without the landing of helicopters in wilderness. This need is especially critical in the event of an epizootic event at which time Arizona Game and Fish Department personnel would have to act quickly to respond, assess, and take management actions to slow the spread of disease

within the bighorn sheep populations.

Criteria for Determining Necessity

Is action necessary to meet any of the criteria below?

A. Valid Existing Rights or Special Provisions of Wilderness Legislation

*Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that **requires** action? Cite law and section.*

☒ YES ☐ NO

Explain:

Wilderness Act: Public Law 88-577

Special Provision -

Section 4 (b): Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

Prohibited Uses-

Section 4 (c): Except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

Section 4 (d) (7): Nothing in this Act shall be construed as affecting the jurisdiction and responsibilities of the several States with respect to wildlife and fish in the national forests.

B. Requirements of Other Legislation

*Is action necessary to meet the requirements of **other federal laws**? Cite law and section.*

☒ YES ☐ NO

Explain:

Sikes Act of 1974, Endangered Species Act of 1973, Federal Land Policy and Management Act of 1976, as amended, and National Forest Management Act of 1976 provide policy and guidelines for management of fish and wildlife on federal lands.

C. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character, including: Untrammeled, Undeveloped, Natural, Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation, or Other Features of Value?

UNTRAMMELED

☐ YES ☒ NO

Explain:

The proposed action is not necessary to preserve the untrammeled quality.

UNDEVELOPED

☐ YES ☒ NO

Explain:

The proposed action is not necessary to preserve the undeveloped quality.

NATURAL

☒ YES ☐ NO

Explain:

Maintaining sustainable bighorn sheep populations and reestablishing bighorn sheep populations in historical bighorn sheep range is the primary objective of the Arizona Game and Fish Department's bighorn sheep management program. Bighorn sheep have historically been part of the natural qualities of these wilderness ecosystems. Reintroducing, augmenting, and monitoring the populations through management actions will help ensure viable populations of bighorn sheep in these wilderness areas and other locations throughout the state. Gathering information on this native species, that was and is believed to be affected from anthropogenic causes, and collecting data important to the species management would contribute to the conservation efforts statewide.

As bighorn sheep populations in these wilderness areas increase, they expand their range outside wilderness into surrounding areas like Goldfield Canyon and near the Heber-Reno domestic sheep driveway. The possibility of bighorn sheep coming into contact with domestic goats and sheep in these areas is a serious concern because of potential disease transmission from domestic animals to wild bighorn sheep. This may have happened in the mid-1990s when the bighorn sheep population in the Four Peaks Wilderness was significantly reduced. The loss of these bighorn sheep populations from an epizootic event would significantly diminish the natural wilderness qualities of these areas.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

☒ YES ☐ NO

Explain:

Observing bighorn sheep in these wilderness areas and those areas that bighorn sheep are reintroduced may contribute to the values of primitive recreation. Observing bighorn sheep is often described as a highlight of primitive recreational experiences. Successful reintroduction, augmentation, and monitoring of these populations may improve this recreational experience. Prior to 1980, bighorn sheep had been extirpated from the Four Peaks and Superstition Wilderness Areas. In 1980, reintroductions of bighorn sheep in these wilderness areas re-established the primitive recreation quality of observing sheep in their historic range as part of the natural component of these wilderness areas.

OTHER FEATURES OF VALUE

☒ YES ☐ NO

Explain:

Public Purposes of Wilderness: Action is necessary to support one or more of the public purposes of wilderness (as stated in Section 4(b) of the Wilderness Act) for recreation, scenic, scientific, education, conservation, and historical use?

Recreation: **Yes:** ☒ **No:** ☐

Explain: The loss of these bighorn sheep herds from an epizootic event would significantly diminish the recreational wilderness experiences of these areas. Wildlife viewing and hunting are recreational activities linked to bighorn sheep occupation of these wilderness areas. A viable bighorn sheep population supports wildlife viewing and hunting opportunities.

Scenic: **Yes:** ☒ **No:** ☐

Explain: Viewing bighorn sheep in wilderness is a public value.

Scientific: **Yes:** ☒ **No:** ☐

Explain: Management actions for bighorn sheep have scientific values. Obtaining health data and information on habitat use and bighorn sheep movements would provide needed scientific data for the development of management actions to maintain sustainable populations of bighorn sheep throughout the state.

Education: **Yes:** ☒ **No:** ☐

Explain: Bighorn sheep management in wilderness has an educational value.

Conservation: **Yes:** ☒ **No:** ☐

Explain: Bighorn sheep have historically been a part of the natural component and qualities of these wilderness area ecosystems. The reestablishment and preservation of these natural components have occurred through conservation efforts involving reintroductions, augmentations and monitoring of bighorn sheep populations in the wilderness areas and prior to the establishment of some wilderness areas. The current action is necessary to support the public purpose of conservation in wilderness.

Historical use: **Yes:** ☒ **No:** ☐

Explain: The Four Peaks, Hellsgate, Mazatzal, Salt River Canyon, and Superstition Wilderness Areas are considered historical bighorn sheep habitat.

Step 1 Decision

Is administrative action necessary in wilderness?

Decision Criteria

- | | | |
|--|---|--|
| A. Existing Rights or Special Provisions | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| B. Requirements of Other Legislation | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| C. Wilderness Character | | |
| Untrammeled | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| Undeveloped | <input type="checkbox"/> YES | <input checked="" type="checkbox"/> NO |
| Natural | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| Outstanding Opportunities | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |
| Other Features of Value | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |

Is administrative action necessary in wilderness?

☒ YES

EXPLAIN AND PROCEED TO STEP 2 OF THE MRDG

☐ NO

STOP – DO NOT TAKE ACTION IN WILDERNESS

Explain:

Existing Rights or Special Provisions: Action is necessary to preserve the public purposes of recreational, scenic, scientific, educational, conservation, and historical use and also maintain the jurisdiction and responsibilities of the Arizona Game and Fish Department with respect to wildlife and fish in the national forests.

Requirements of Other Legislation: Action is necessary to meet policies and guidelines for management of fish and wildlife on federal lands

Natural: Reintroduction, augmentation, and monitoring for sustainability of bighorn sheep populations that are indigenous to these wilderness areas is intrinsically important to the natural quality of wilderness character.

Outstanding Opportunities for Solitude and Primitive and Unconfined Recreation: Reintroductions, augmentations and monitoring of bighorn sheep in these wilderness areas re-establishes and preserves the primitive recreation quality of observing sheep in their historic range as part of a natural component of these wilderness areas.

Other Features of Value: Bighorn sheep have historically been a part of the natural component and qualities of these wilderness area ecosystems. Conservation efforts establish and preserve this public purpose. Scenic, scientific and educational use also has public value and supports these public purposes. Wildlife viewing and hunting are recreational activities linked to bighorn sheep occupation of these wilderness areas. A viable bighorn sheep population supports wildlife viewing and hunting opportunities for recreational purposes.

Effects will be described in terms of intensity, duration, and context

Intensity terminology

- Negligible:** Effects would be negligible in intensity and duration.
- Minor:** Effects on one or more qualities of wilderness character are detectable, but the effects would be both site-specific and temporary or short-term duration.
- Moderate:** Effects on one or more qualities of wilderness character are appreciable, occur in several bighorn sheep populations at the same time, and are medium-term (one to ten years) in duration.
- Major:** Effects would substantially alter one or more qualities of wilderness character. Effects would be observed over a larger area (i.e. wilderness-wide) and for a long-term duration (more than ten years).

Duration terminology

- Temporary:** Effects to bighorn sheep would not persist for more than one day. Effects on visitors' wilderness experience would be temporary in duration, such as a nearby helicopter landing with the helicopter on the ground for five minutes.
- Short-term:** Effects would occur over more than one day but less than one month.
- Medium term:** Effects would occur over the duration of the proposed project (10 years).
- Long-term:** Effects would occur after project work is completed and would have lasting effects (more than 10 years) on wilderness character.

Context (area of effects) terminology

Site-specific: Confined to the localized area where capture activities would occur.

MRDG STEP 2

Determine the Minimum Activity

Other Direction

Is there “special provisions” language in legislation (or other Congressional direction) that explicitly **allows** consideration of a use otherwise prohibited by Section 4(c)?

AND/OR

Has the issue been addressed in agency policy, management plans, species recovery plans, or agreements with other agencies or partners?

☒ YES

DESCRIBE DOCUMENTS & DIRECTION BELOW

☐ NO

SKIP AHEAD TO COMPONENTS OF THE ACTION BELOW

Describe Documents & Direction:

Action is necessary to conform to direction contained in species recovery plans, and agreements with state governments. The following documents provide reference and guidance to Region 3 U.S. Forest Service (FS) personnel when participating, collaborating, and coordinating with Arizona Game and Fish Department with regards to wildlife management in the State of Arizona; and specifically the proposed bighorn sheep management project on the Tonto National Forest. Those guiding documents are:

1. Policies and Guidelines for Fish and Wildlife Management in National Forest and Bureau of Land Management Wilderness (as amended June, 2006)
2. Superstition Wilderness Implementation Plan (October 31, 1985)
3. Four Peaks Wilderness Plan (November 1, 1998)
4. Mazatzal Wilderness Implementation Plan (March 14, 1994)
5. Hellsgate Wilderness Implementation Plan (September 30, 1993)
6. Salt River Canyon Wilderness Implementation Plan (May 11, 1993)
7. Master Memorandum of Understanding between the U.S. Department of Agriculture Forest Service and Southwestern Region and the Arizona Game and Fish Commission and Department (2010)
8. Arizona Game and Fish Department Bighorn Sheep Management Guidelines (2006)
9. Arizona Game and Fish Department Final Project Implementation Priorities (2012)
10. Facilitation of Hunting Heritage and Wildlife Conservation (Executive Order 13443 of August 16, 2007)
11. Forest Service Manual – Chapter 2320 – Wilderness Management
12. Minimum Decision Requirement Guide (version 2009b)

Policies and Guidelines for Fish and Wildlife Management in National Forest and Bureau of land Management Wilderness (as amended June, 2006)

Purpose: (Page 1.) This statement of policy and the following guidelines are intended to provide guidance to State fish and wildlife agencies, FS and Bureau of Land Management (BLM) personnel for the management of fish and wildlife populations in wilderness in accordance with the Wilderness Act of 1964. Both State and Federal agencies are

responsible for fostering mutual understanding and cooperation in the management of fish and wildlife in wilderness. The purpose of these guidelines is to develop and expand a framework of cooperation upon which projects and activities may be planned and accomplished while working cooperatively at the National, regional, and local levels. These guidelines serve as a framework for cooperation among the FS, BLM and the States in the coordination of fish and wildlife management and in the development of cooperative agreements or other management plans.

General Policy: (Pages 4-5) Fish and wildlife management activities in wilderness will be planned and implemented in conformance with the Wilderness Act's purpose of securing an "enduring resource of Wilderness..."

Proposed fish and wildlife management activities that would involve uses generally prohibited under Section 4c of the Wilderness Act will be considered and may be authorized by the Federal administering agency. The FS and BLM will consult closely with States and give careful consideration to State fish and wildlife interests when considering these proposed activities, subject to applicable National Environmental Policy Act review, where determined through the Minimum Requirements Decision Process to be a necessary action. Additionally, the minimum tool to accomplish necessary fish and wildlife management activities as determined through the MRDG, will be recommended by the State and reviewed by the Federal administering agency, in close consultation with the State, and approved where determined appropriate.

Section 4(d)(7) of the Wilderness Act stipulates that "Nothing in the Act shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish in the national forests." These policies and guidelines should not be construed as diminishing or expanding the State jurisdiction and responsibility to manage fish and wildlife.

Project Implementation: (Pages 6-13)

Use of Motorized Equipment: The State's fish and wildlife management activities within wilderness can be accomplished with motor vehicles, motorized equipment, or mechanical transport, only if these devices are necessary to meet the minimum requirements for the administration of the area as wilderness or are specifically permitted by other provisions of the Act. Any such use should be rare and temporary; no roads can be built; and proposals for use of motorized equipment will be considered and may be authorized by the Federal land management agency, in cooperation with the State, through application of the Minimum Requirements Decisions Process (MRDP) as outlined in Section E., General Policy. Any use of motorized equipment or mechanical transport requires advanced approval by the Federal administering agency.

Transplanting Wildlife: Transplants (removal, reintroduction, or supplemental introduction) of terrestrial wildlife species in wilderness may be permitted if necessary: (a) to perpetuate or recover a threatened or endangered species; (b) to restore the population of an indigenous species; or (c) to manage wildlife populations in accordance with the States' wildlife population objectives.

In 2001, the FS reaffirmed its commitment to the "Policy and Guidelines for Fish and Wildlife Management in National Forest and Bureau of Land Management Wilderness" as provided under the MOU between the FS, BLM, and International Association of Fish and Wildlife Agencies (AFWA). It states:

“Research on fish and wildlife, their habitats, and the recreation users of these resources is a legitimate activity in wilderness when conducted in a manner compatible with the preservation of the wilderness environment (Section 4(d)(1) of the Wilderness Act). Methods that temporarily impinge on the wilderness environment may be approved if alternative methods or other locations are not available. Research or management activities must be approved in writing, on a case-by-case basis by the administering agency.”

Note – The 2001 AFWA agreement has been superseded by the 2006 Association of Fish and Wildlife Agencies (AFWA) MOU which states:

Fish and Wildlife Research and Management Surveys

Research and evaluation related to fish and wildlife, their habitats and the recreational users of these resources are legitimate activities in wilderness when conducted in a manner compatible with the area as wilderness. Coordination of all research and survey activities is essential between State and Federal agencies. Methods that temporarily infringe on the wilderness environment may be authorized by the Federal administering agency if alternative methods or other locations are not reasonably available. Research or management survey activities that would involve uses generally prohibited under Section 4 (c) of the Wilderness Act will be considered and may be authorized by the Federal administering agency through application of the MRDP as outlined in Section E., General Policy.

Helicopters and fixed-wing aircraft over flights may be used to conduct fish and wildlife research and management activities. Use of aircraft for these activities will be coordinated among the State and Federal agencies to minimize conflicts with other wilderness uses. To the greatest extent possible, aircraft must be used in a manner that minimizes disturbance to wilderness character and to human and wildlife use of the wilderness.

Aerial counts and observations (i.e. surveys) of wildlife are allowed in the management of fish and wildlife resources in wilderness. Capturing and marking of animals, radio telemetry, and occasional installations (such as shelters for cameras and scientific apparatus and enclosures essential for wildlife research or management surveys) that would involve uses generally prohibited under Section 4 (c) of the Wilderness Act will be considered and may be authorized by the Federal administering agency through application of the MRDP as outlined in Section E., General Policy.

Guidelines for Fish and Wildlife Research and Management Surveys

- a. Obtain specific written approval or permits from the Federal administering agency before erecting any structure, enclosure, or exclosure.
- b. Locate and construct all structures so as to make them unobtrusive on the landscape.
- c. Construct structures of native materials or camouflage to make them blend with their natural surroundings.
- d. Plan aircraft flights over wilderness to minimize disturbance. Consider time of day, season of the year, route and altitude of flight, and location of landing areas on the perimeter of the wilderness.
- e. Research projects underway when a wilderness is designated may continue, but research methods should be modified, if possible, to minimize disturbance of the wilderness environment.
- f. Installation of base stations for monitoring of radio-instrumented animals will be

considered and may be authorized by the Federal administering agency through application of the MRDP as outlined in Section E., General Policy.

- g.** The Federal administering agency should only approve methods that minimize the impact on the wilderness environment to the greatest extent possible.

Superstition Wilderness Implementation Plan (October 31, 1985)

C. MANAGEMENT OF WILDLIFE, FISH AND HABITAT (All species not on Federal Threatened and Endangered List) (Page 30)

Implementation Objective. In cooperation with the Arizona Game and fish Department (AGFD), apply the "Policies and Guidelines for Fish and Wildlife Management in National Forest and Bureau of Land Management (BLM) wilderness (FSH 2309.19, chapter 23.1) in a practical, reasonable, and uniform manner". Several important concepts in this document are:

- Management activities will be guided by the principle of doing only the minimum necessary to manage the area as wilderness;
- Management activities will allow natural processes to control wilderness ecosystems and their wildlife to the greatest extent possible;
- Keep wildlife naturally wild, with behavior and numbers altered as little as possible by human influence and actions;
- Allow viewing and State authorized hunting, fishing, and trapping where such activities are (a) biologically sound, (b) legal, and (c) conducted in the spirit of the wilderness experience.

1. Current Situation

a. The Superstition Wilderness, due to its size, topography, and remoteness, provides habitat for a wide variety of wildlife species. Wildlife is an important component of the wilderness resource. The area provides opportunities for the viewing, scientific study, hunting, and trapping of wildlife species.

b. Actual wildlife management is vested with AGFD, while habitat management is the responsibility of the FS.

d. The Regional Forester's Sensitive Species List which includes Federal and State-listed Threatened and Endangered (T&E) species and FS-listed sensitive species is found in FSM 2670.

f. Desert bighorn sheep were historically found in this Wilderness. The last one is believed to have been poached in the 1940s in the Lewis and Pranty drainage. In 1983, thirty sheep were released by AGFD on Horse Mesa and in 1984, thirty sheep were released just outside the Wilderness southwest of the JF Headquarters. The Majority of these sheep reside within the peripheral areas of the Superstition Wilderness adjoining Arizona State Land and Tonto National Forest. In 1987 and 1989, additional animals were reintroduced (via helicopter) on Tortilla Mountain.

h. This Wilderness is located entirely within AGFD Management Unit 24B.

3. Implementation Policy

a. FS and AGFD actions will be predicated on need for protection and maintenance of the Wilderness resource (including wildlife and their respective habitats) in an untrammelled condition. All management activities will follow direction as established in FSH 2309.19, chapter 23.1.

d. All trapping, transplanting, and monitoring of indigenous wildlife species and associated activities by AGFD will adhere to FS Policy regarding equipment use and transportation (see FSM 2326, FSH 2309.19, and Appendix C).

i. Forest Wildlife personnel will coordinate wildlife management actions in the Wilderness

with District and Forest Wilderness Staff.

Four Peaks Wilderness Implementation Plan (November 1, 1998)

C. MANAGEMENT OF FISH, WILDLIFE, AND HABITAT (All Species not on Federal Threatened and Endangered List)

Implementation Objective. In cooperation with the Arizona Game and Fish Department (AGFD), apply the "Policies and Guidelines for Fish and Wildlife Management in National Forest and Bureau of Land Management (BLM) wilderness (FSH 2309.19, chapter 23.1) in a practical, reasonable, and uniform manner. Several important concepts in this document are:

- Management activities will be guided by the principle of doing only the minimum necessary to manage the area as wilderness;
- Management activities will allow natural processes to control wilderness ecosystems and their wildlife to the greatest extent possible;
- Keep wildlife naturally wild, with behavior and numbers altered as little as possible by human influence and actions;
- Allow viewing and State authorized hunting, fishing, and trapping where such activities are (a) biologically sound, (b) legal, and (c) conducted in the spirit of the wilderness experience.

1. Current Situation

a. The Four Peaks Wilderness, due to its size, topography, and remoteness, provides habitat for a wide variety of wildlife species. Wildlife is an important component of the wilderness resource. The area provides opportunities for the viewing, scientific study, hunting, and trapping of wildlife species.

b. Actual wildlife management is vested with AGFD, while habitat management is the responsibility of the FS.

c. The Three Bar Wildlife Area boundary falls within the eastern portion of the Wilderness Area. The area has been utilized for wildlife research by AGFD under a cooperative agreement with the FS. Livestock have been excluded since the mid-1930s.

e. The Regional Forester's Sensitive Species List which includes Federal and State-listed T&E species and FS-listed sensitive species is found in FSM 2670.

f. Desert bighorn sheep have been successfully re-introduced in the Goat Mountain, Sheep Mountain, and El Recortado areas in the Wilderness.

i. This Wilderness is located entirely within AGFD Management Unit 22.

3. Implementation Policy

a. FS and AGFD actions will be predicated on need for protection and maintenance of the Wilderness resource (including wildlife and their respective habitats) in an untrammelled condition. All management activities will follow direction as established in FSH 2309.19, chapter 23.1.

e. All trapping, transplanting, and monitoring of wildlife species by AGFD will adhere to Forest Service Policy regarding equipment use and transportation (see FSM 2326, FSH 2309.19 and Appendix C).

h. Forest Wildlife personnel will coordinate wildlife management actions in the Wilderness with District and Forest Wilderness Staff.

Mazatzal Wilderness Implementation Plan (March 14, 1994)

C. MANAGEMENT OF FISH, WILDLIFE, AND HABITAT (All Species not on Federal Threatened and Endangered List)

Implementation Objective. In cooperation with the Arizona Game and Fish Department (AGFD), apply the "Policies and Guidelines for Fish and Wildlife Management in National

Forest and Bureau of Land Management (BLM) wilderness (FSH 2309.19, chapter 23.1) in a practical, reasonable, and uniform manner. Several important concepts in this document are:

- Management activities will be guided by the principle of doing only the minimum necessary to manage the area as wilderness;
- Management activities will allow natural processes to control wilderness ecosystems and their wildlife to the greatest extent possible;
- Wildlife will remain naturally wild with behavior and numbers altered as little as possible by human influence and actions;
- Allow wildlife viewing and State authorized hunting, fishing and trapping where such activities are (a) biologically sound, (b) legal, and (c) conducted in the spirit of the wilderness experience.

1. Current Situation

a. The Mazatzal Wilderness, due to its size, topography, and remoteness, provides habitat for a wide variety of wildlife species. Wildlife is an important component of the wilderness resource. The area provides opportunities for species reintroduction, viewing, scientific study, hunting, fishing, and trapping of wildlife species.

b. Actual wildlife management is vested with AGFD, while habitat management is the responsibility of the Forest Service.

c. The Regional Forester's Sensitive Species List which includes State-listed Threatened Species and Forest Service-listed Sensitive Species is found in FSM 2670.

d. The Gila Chub occurred historically and re-introduction is currently planned.

e. Desert Bighorn Sheep were re-introduced in the vicinity of Lion Mountain in 1985. This attempt at re-introduction has been considered unsuccessful as the animals generally scattered and did not establish a viable herd in the intended home range. The location and number of any survivors is unknown.

f. A River Otter re-introduction program was initiated along the Verde River in 1980. Otters are protected by the State though the area is open to legal hunting and trapping.

g. The Verde and East Verde rivers are the primary fishable waters known in this Wilderness. Several species of native and non-indigenous fish can be found in these streams.

h. Overgrazing in some locations has been detrimental to wildlife habitats, especially riparian areas. See range Analysis and AMPs specific to allotments for detailed information.

i. The Mazatzal Wilderness is located within AG&F Management Units 21 and 22.

j. Some animal species existing within the Mazatzal Wilderness are non-indigenous, but were established at the time of Wilderness designation.

k. There are no wildlife watering/habitat structures in this Wilderness.

3. Implementation Policy

a. FS and AGFD actions will be predicated on need for protection and maintenance of the Wilderness resource (including wildlife and their respective habitats) in an untrammelled condition. All management activities will follow direction as established in FSH 2309.19, chapter 23.1.

e. All trapping, transplanting, and monitoring of indigenous wildlife species by AGFD will adhere to Forest Service Policy regarding equipment use and transportation (see FSM 2326, FSH 2309.19 and Appendix C).

i. Forest Wildlife personnel will coordinate wildlife management actions in the Wilderness with District and Forest Wilderness Staff.

Hellsgate Wilderness Implementation Plan (September 30, 1993)

C. MANAGEMENT OF FISH, WILDLIFE, AND HABITAT (All Species not on Federal Threatened and Endangered List)

Implementation Objective. In cooperation with the Arizona Game and Fish Department (AGFD), apply the “Policies and Guidelines for Fish and Wildlife Management in National Forest and Bureau of Land Management (BLM) wilderness (FSH 2309.19, chapter 23.1) in a practical, reasonable, and uniform manner. Several important concepts in this document are:

- Management activities will be guided by the principle of doing only the minimum necessary to manage the area as wilderness;
- Management activities will allow natural processes to control wilderness ecosystems and their wildlife to the greatest extent possible;
- Wildlife will remain naturally wild with behavior and numbers altered as little as possible by human influence and actions;
- Allow wildlife viewing and State authorized hunting, fishing and trapping where such activities are (a) biologically sound, (b) legal, and (c) conducted in the spirit of the wilderness experience.

1. Current Situation

a. The Hellsgate Wilderness, due to its size, topography, and remoteness, provides habitat for a wide variety of wildlife species. Wildlife is an important component of the wilderness resource. The area provides opportunities for species reintroduction, viewing, scientific study, hunting, fishing, and trapping of wildlife species.

b. Actual wildlife management is vested with AGFD, while habitat management is the responsibility of the Forest Service.

c. The Regional Forester’s Sensitive Species List which includes State-listed Threatened Species and Forest Service-listed Sensitive Species is found in FSM 2670.

d. Blumer’s dock, (*Rumex orthoneurus*), narrow-headed garter snake (*Thamnophis rufipunctatus*), Arizona Southwestern toad (*Bufo microscaphus microscaphus*), and Sierra Ancha fleabane (*Erigeron anchana*) are category 1 and category 2 candidates for T&E listing which are known to exist within or in close proximity to the Wilderness.

e. Fish inhabited waters include Tonto Creek, Haigler Creek, Spring Creek, and Houston Creek. Species of native and non-indigenous fish can be found in these streams. Roundtail chub (*Gila robusta grahami*) is a category 2 candidate and is known to exist within the Wilderness.

f. Overgrazing in some locations has been detrimental to wildlife habitats. See Range Analysis and AMPs specific to allotments for detailed information.

g. The Hellsgate Wilderness is located within AG&F Management Units 22 and 23.

h. Some animal species existing within the Hellsgate Wilderness are non-indigenous, but were established at the time of Wilderness designation.

i. There are no wildlife watering/habitat structures in this Wilderness.

j. Brown, brook and rainbow trout have been stocked in and adjacent to the Wilderness in the past. Rainbow trout continue to be regularly stocked upstream in Tonto and Haigler Creeks.

3. Implementation Policy

a. FS and AGFD actions will be predicated on need for protection and maintenance of the Wilderness resource (including wildlife and their respective habitats) in an untrammelled condition (see Glossary). All management activities will follow direction as established in FSH 2309.19, chapter 23.1.

e. All trapping, transplanting, and monitoring of indigenous wildlife species by AGFD will adhere to Forest Service Policy regarding equipment use and transportation (see FSM 2326, FSH 2309.19 and Appendix C).

- i. Forest Wildlife personnel will coordinate wildlife management actions in the Wilderness with District and Forest Wilderness Staff.

Salt River Canyon Wilderness Implementation Plan (May 11, 1993)

C. MANAGEMENT OF WILDLIFE AND FISH (All Species not on Federal Threatened and Endangered List)

Implementation Objective. In cooperation with the Arizona Game and Fish Department (AGFD), apply the "Policies and Guidelines for Fish and Wildlife Management in National Forest and Bureau of Land Management (BLM) wilderness (FSH 2309.19, chapter 23.1) in a practical, reasonable, and uniform manner. Several important concepts in this document are: To seek natural distribution, numbers and interaction of indigenous species of wildlife.

- To allow natural processes to control wilderness ecosystems and their wildlife to the greatest extent possible;
- To keep wildlife naturally wild, with behavior and numbers altered as little as possible by human influence and actions;
- To permit viewing, State authorized hunting, fishing and trapping where such activities are (a) biologically sound, (b) legal, and (c) conducted in the spirit of the wilderness experience.

1. Current Situation

- a. The Salt River Canyon Wilderness, due to its size and topography, provides habitat for a wide variety of wildlife species. Wildlife is an important component of the wilderness resource. The area provides opportunities for viewing, scientific study, hunting, fishing, and trapping of wildlife species.
- b. Management of the animals is vested with the Arizona Game and Fish Department, while habitat management is the responsibility of the Forest Service.
- c. Federal and State T&E species lists can be found in the Regional Forester's Sensitive Species List: FSM 2670.
- d. The Gila Chub occurred historically and re-introductions are currently planned.
- e. River Otter occurrence was last confirmed in 1976.
- f. There are 26 species of native and introduced fishes in these waters. Game fish include Channel and Flathead catfish, Black Bullhead, small and largemouth bass, green sunfish and Bluegill. Suckers and carp are taken to some extent.
- g. Overgrazing in some locations has been detrimental to wildlife habitats, however AMPs developed since 1980 have significantly improved range conditions overall. See Range Analysis documents and AMPs for specific information.
- h. Much of the riparian community is in a degraded condition. All threatened species listed in item 3 (except the desert tortoise) are dependent on riparian habitat.
- i. Some animal species existing within the Salt River Canyon Wilderness are non-indigenous, but were established at the time of Wilderness designation.

2. Implementation Policy

- a. Forest Service personnel will provide input to the Region VI Supervisor early each year regarding Hunt Guidelines and (where appropriate) Hunt Recommendations. Forest recommendations will be predicated on need for protection and maintenance of the wilderness resource (including fish and

wildlife and their respective habitats) in an untrammelled condition.

3. Implementation Action

- a. Trapping and transplanting of indigenous wildlife species by the Arizona Game and Fish Department will adhere to Forest Service Policy regarding equipment use and transportation.

Master Memorandum of Understanding between the U.S. Department of Agriculture Forest Service and Southwestern Region and the Arizona Game and Fish Commission and Department (2010)

“The purpose of this MOU is to establish a framework for statewide cooperation, coordination, and collaboration between the U.S. Forest Service and the Arizona Game and Fish Department for management and conservation of fish and wildlife populations and habitats on National Forest System lands in Arizona.”

Joint Policy Statement (page 1): “The U.S. Forest Service is responsible for managing fish and wildlife habitat on National Forest System Lands, and the Department and Commission have statutory authority and public trust responsibility to manage fish and wildlife populations in Arizona, including on the National Forest System Lands.”

“The Department’s Mandate to meet statutory trust responsibilities to manage fish and wildlife populations is supported by the U.S. Forest Service and incorporated where appropriate in Forest Land and Resource Management Plans...Implementation level plans and site-specific projects will be evaluated and finalized through appropriate coordination, partnerships, and processes that reflect the spirit and intent of this MOU.”

The U.S. Forest Service Agrees: (page 3):

- Item 3. To recognize the Commission and Department as having primary responsibility for managing fish and wildlife populations consistent with State and Federal Law.
- Item 7. To Recognize and give full consideration to conservation of the State’s fish and wildlife species of concern and their habitats, including Species of Greatest Conservation need.
- Item 17. Coordinate with the Department to facilitate their administrative access needs consistent with laws, regulation, and policy.

The U.S. Forest Service and the Department mutually agree: (page 7)

- Item 8. To coordinate efforts that ensure continued conservation of the State’s fish and wildlife species of concern, including Species of Greatest Conservation Need.
- Item 9. To coordinate on proposals for establishing, transplanting, and supplementing fish and wildlife populations to or from our National Forest System Lands following the processes outlined within this MOU.
- To recognize fish and wildlife as important wilderness resources and work collaboratively to ensure that within designated wilderness, fish and wildlife management programs are consistent with the Wilderness Act (1964), and to work cooperatively in following the purpose and intent of the “Policies and Guidelines for Fish and Wildlife Management in National Forest and Bureau of Land Management Wilderness (as amended June, 2006).”

Arizona Game and Fish Department Bighorn Sheep Management Guidelines (2006)

Goal: Increase bighorn sheep populations and provide diverse recreational opportunities.

Objectives: (6) Maintain the existing range of all subspecies in Arizona, and repopulate historical range through translocations.

Species Specific strategies: (2) Establish self-sustaining populations of bighorn sheep at all new transplant sites; (3) Evaluate transplant sites for Rocky Mountain Bighorn Sheep and implement further transplants where appropriate.

Procedure 6: To restock former bighorn sheep range:

- Potential bighorn sheep transplant sites will be determined according to the evaluation of bighorn sheep habitat described in "The desert bighorn sheep in Arizona" (Cunningham 1989). Transplants will be accomplished in accordance with the Big Game Transplant Procedures.
- When Regional personnel determine that a particular bighorn sheep population can be used as a source for sheep, animals may be transplanted from this population to the priority ranking area within the historic range of the subspecies to be captured. The Big Game Supervisor must approve all transplant sites. Actual release location will be determined jointly by Field Operations and Game Branch personnel. Extra-Departmental requests for bighorn sheep must be in accordance with Arizona Game and Fish Department Policy and Procedures.
- Arizona Game and Fish Department personnel may capture bighorn sheep using helicopter and capture gun procedures or drop-net captures may be attempted throughout the year using suitable bait, such as apple mash bait. Other techniques may be developed. Capture techniques are described in "The desert bighorn sheep in Arizona" (Remington and Fuller 1989). Each release will require a minimum of 15 animals. Preferably these will be 65% ewes, 20% yearlings, and 15% medium aged rams (Classes II and III).
- Captured bighorn sheep will be transported to the release area by trailer or helicopter. Transportation procedures are outlined in "The desert bighorn sheep in Arizona" (Remington and Fuller 1989). Animals may be "free" released or kept in temporary holding pen(s) at the release site and "soft" released from 4 to 24 hours after arrival. A minimum of four to six ewes should be radiomarked for monitoring purposes.
- Released bighorn sheep will be monitored by Field Operations personnel. The need for supplemental releases shall be jointly determined on an ad hoc basis by regional and Game Branch personnel.

Arizona Game and Fish Department Final Project Implementation Priorities (2014)

(Note: This document is supplied as a companion document for the second year of the Department Operational Plan to facilitate Implementation Plan development for the bighorn sheep management project across the state.)

Project: Game Management

Job: Game Management

Game Translocations: These are planned efforts, including post-release monitoring and reporting.

- Region 4 may translocate bighorn sheep from the Trigo Mountains in Unit 43B to the Catalina Mountains in Unit 33 (Regions 4, 5 and Game Branch)
- Continue monitoring and developing a threat assessment associated with Rocky Mountain Bighorn sheep herd movements from Units 6A into desert bighorn occupied range within Region 6 (Region 6).
- Region 6 may capture and radio-collar additional Rocky Mountain bighorn sheep in

northern Unit 22 to supplement existing monitoring efforts

Facilitation of Hunting Heritage and Wildlife Conservation (Executive Order 13443 of August 16, 2007)

Section 1. Purpose. The purpose of this order is to direct Federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of these game species and their habitat.

Section 2. Federal Activities. Federal agencies shall, consistent with agency missions:

c. Manage wildlife and wildlife habitats on public lands in a manner that expands and enhances hunting opportunities, including through the use of hunting in wildlife management planning;

d. Work collaboratively with State governments to manage and conserve game species and their habitats in a manner that respects private property rights and State management authority over wildlife resources;

e. Establish short and long term goals, in cooperation with State and tribal governments, and consistent with agency missions, to foster healthy and productive populations of game species and appropriate opportunities for the public to hunt those species

FSM 2300 – RECREATION, WILDERNESS, AND RELATED MANAGEMENT, CHAPTER 2320 WILDERNESS MANAGEMENT

2323.04 - Responsibilities

2323.04c - Regional Forester

4. Developing, with the involved State(s), a supplement to the State/Forest Service memorandum of understanding, which will establish fish and wildlife management coordination in wilderness. The joint Forest Service and International Association of Fish and Wildlife Agencies Guidelines will be used to develop compatible management activities.

2323.3 - Management of Wildlife and Fish

2323.31- Objectives

1. Provide an environment where the forces of natural selection and survival rather than human actions determine which and what numbers of wildlife species will exist.

2. Consistent with objective 1, protect wildlife and fish indigenous to the area from human caused conditions that could lead to Federal listing as threatened or endangered.

3. Provide protection for known populations and aid recovery in areas of previous habitation, of federally listed threatened or endangered species and their habitats.

2323.32 Policy

1. Recognize that States have jurisdiction and responsibilities for the protection and management of wildlife and fish populations in wilderness. Cooperate and work closely with State wildlife and fish authorities in all aspects of wildlife and fish management. Base any Forest Service recommendation to the State wildlife and fish agencies on the need for protection and maintenance of the wilderness resource. Recognize wilderness protection needs and identify any needed requirements in coordination efforts and in cooperative agreements with State agencies.

2. Wildlife and fish management programs shall be consistent with wilderness values.

3. Discourage measures for direct control (other than normal harvest) of wildlife and fish populations.

4. Manage wilderness to protect known populations of federally listed threatened or endangered species where necessary for their perpetuation and aid in their recovery in areas of previous habitation. When alternative areas outside of the wilderness offer equal or better protection, take actions to recover threatened or endangered species outside of wilderness areas first.

5. Apply the "Policies and Guidelines for Fish and Wildlife Management in Wilderness and Primitive Areas," developed jointly by the Forest Service, Bureau of Land Management, and the International Association of Fish and Wildlife Agencies (FSH 2309.19) in a practical, reasonable, and uniform manner in all National Forest wilderness units. Use the guidelines as a foundation for or as addendums to State or individual wilderness cooperative agreements.

2323.33 - Wildlife Management

2323.33a - Reintroductions

Reintroduce wildlife species only if the species was once indigenous to an area and was extirpated by human induced events. Favor federally listed threatened or endangered species in reintroduction efforts. Reintroductions shall be made in a manner compatible with the wilderness environment. Motorized and mechanical transport may be permitted if it is impossible to do the approved reintroductions by nonmotorized methods.

2323.33b-Habitat Surveys and Populations Inventories

Conduct wildlife habitat surveys and population assessments in a manner compatible with the wilderness environment

2323.37- Wildlife and Fish Research

Wildlife and fish research is an appropriate activity in wilderness. In all cases, research shall be conducted in such a way as to minimize any adverse impacts on the wilderness research or its users.

1. Research methods that temporarily infringe on the wilderness character may be used; provided the information sought is essential for wilderness management and alternative methods or locations are not available.

2 Scientific sampling of wildlife and fish populations is essential to the management of natural populations in wilderness.

3. Capturing and inconspicuous marking of animals, including telemetry, is permitted.

Components of the Action

What are the discrete components or phases of the action?

Component X: *Example: Transportation of personnel to the project site*

Component 1: Method of access to site

Component 2: Method of capturing sheep

Component 3: Method of processing and transporting sheep

Component 4: Conditions after capture

Component 5:

Component 6:

Component 7:

Component 8:

Component 9:

Proceed to the alternatives.

Refer to the [MRDG Instructions](#) regarding alternatives and the effects to each of the comparison criteria.

MRDG STEP 2: Alternative 1

Alternative 1: Net gun Capture with Helicopters

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

The Arizona Game and Fish Department would fly and land helicopters within the boundaries of the Four Peaks, Hellsgate, Mazatzal, Salt River Canyon, and Superstition Wilderness Areas beginning in November 2014 for a minimum of 10 years (2024) to capture bighorn sheep using a net gun fired from a helicopter. The frequency, duration, and intensity of these activities are described below. There would be two types of bighorn sheep net gun captures (with helicopters); monitoring captures and translocation captures.

Monitoring Captures - Monitoring captures include those which involve locating bighorn sheep, affixing VHF/GPS collars, and obtaining health information on individual bighorn sheep before the bighorn sheep is released on site.

Translocation Captures - Translocation captures include those captures for the purpose of augmenting existing herds or reintroducing bighorn sheep into currently unoccupied historic range and requires both the capture of individual bighorn sheep from a source population, and the transport and release of those bighorn sheep into other areas in the state as determined by the Arizona Game and Fish Department.

For translocation captures, bighorn sheep would initially be located from a helicopter and captured by using a net gun fired from the helicopter at close range. Immediately after firing the net, the helicopter would land nearby for approximately ten minutes and one or two crew members would exit the helicopter and restrain the bighorn sheep. No chemical immobilization is required for this technique. Captured bighorn sheep would then be transported via helicopter, using internal or external rigging, to a staging area on the Tonto National Forest or Arizona State Trust Lands (located outside of designated wilderness). Once a bighorn sheep is captured it receives a physical examination; age and body condition (i.e., body fat) would be measured, and blood and fecal samples would be collected to survey population health by screening for exposure to diseases and parasites loads. An Arizona Game and Fish Department wildlife health specialist would participate in all captures and translocations and would ensure the health of all animals and attend to any health concerns. Captured bighorn sheep would be fitted with VHF and/or GPS collars and marked with numbered and colored ear tags. Since VHF collars have a lifespan of approximately two years and can be active for as long as five years, they would likely be on animals for the remainder of their lives. GPS collars in current use by the Arizona Game and Fish Department are programmed to drop off automatically after two years. Care would be taken to ensure that the collars are fit snugly and do not slide up and down the animal's neck. After handling is complete, specific bighorn sheep identified for translocation would be loaded into a trailer for transportation to the designated release site.

Translocations would only occur in years where population size supports the removal of animals; therefore translocation captures would not occur every year, and would not occur in the same wilderness area every year. For translocation captures in any given year, a maximum of 60 helicopter landings would occur (no more than 30 in any one wilderness area) over a maximum of six days. Helicopter landings would occur when bighorn sheep are captured from the source population (Four Peaks and Superstition Wilderness Areas) and transported by helicopter to a staging area with road access which allows animals to be transported to the release site by vehicle outside of designated wilderness. Translocation captures would be conducted during the month of November and would focus on a predetermined ratio of males to females. Captures would be planned based on current weather conditions and the availability of source stock. Capture periods within these source populations would occur over a total of a one-week period, with work occurring over a one to three day period annually within each wilderness area. The maximum number of animals removed per year from a single source population would be approximately 30 animals. Typically, only one helicopter landing is required per bighorn sheep, although there are times when a helicopter landing is required to pick up a net that was fired and missed.

In any given year the maximum number of days spent on monitoring capture work for all wilderness areas would be nine days (three days for each wilderness) and the approximate number of helicopter landings, in any given year, is 30 (ten collars each in Hells Gate, Mazatzal, and Salt River Canyon). Bighorn sheep would be transported via helicopter to their initial capture location, where the release crew would be waiting to release the animal. After the bighorn sheep is released, the crew will re-enter the helicopter. The other option for this capture method is that bighorn sheep processing would be completed at the capture site by the capture crew and the animal is released on site after processing. In these cases the helicopter would land for approximately 30 minutes. Capture time for this method is approximately one to three days annually in each wilderness area depending on the number of bighorn sheep to be captured.

Monitoring captures would occur within the Hells Gate, Mazatzal, and Salt River Canyon Wilderness Areas. Monitoring captures may occur in the Four Peaks and Superstition Wilderness Areas if potential disease is detected. Monitoring captures would be conducted at times of the year (during the month of November) that minimizes the impact to the animals both physically and socially. Occasionally monitoring captures may occur at other times of the year should potential disease be detected, VHF/GPS collars fail prematurely, or mortality investigations warrant more immediate response to inform management decisions. Captures would be planned based on current weather conditions and needs. The need for monitoring captures would be based upon the repair and replacement schedule of VHF/GPS collars (the average collar life is two years). Not all wilderness areas would receive monitoring captures every year, as the needs for monitoring captures can change from year to year and depend on available funding, equipment, personnel and weather conditions.

Approximately 450 helicopter landings would be required over a 10-year period to capture bighorn sheep with a maximum of 90 landings occurring per year (Table 2).

Table 2. Maximum number of helicopter landings and days for both monitoring and translocation captures of bighorn sheep within wilderness.

Wilderness Area and Type of Capture M = Monitoring, T = Translocation	Maximum Number of Helicopter Landing in any Given Year	Maximum Number of Days in any Given Year
Four Peaks (T)	30	3
Hells Gate (M)	10	3
Mazatzal (M)	10	3
Salt River Canyon (M)	10	3
Superstition (T)	30	3
Combined Maximum for any Given Year	90	15
Combined Maximum for the Project (10 years)*	450	75

* Captures would not occur annually. Captures may occur at an interval of every other year in any given wilderness due to limitations on funding and conservative biological constraints for removing bighorn sheep from any one source population.

Although the number of captures and therefore the number of helicopter landings can vary in any given year, they would not exceed 90 landings annually. All monitoring and translocation captures are dependent upon multiple variables which only allow for best approximations or averages for a maximum number of landings and days spent on captures annually and over the minimum ten year authorization period. In most cases all helicopter landing will occur during a one to three day working period in any given wilderness. Population growth rates, collar condition and functionality, weather conditions, and stochastic events (collar failures, disease outbreaks, etc.) may affect the number and type of captures conducted, as would the availability of funds, equipment, and personnel. The maximum numbers presented for days and landings are based on the best information available at this time, including projected population growth rates, collar replacement schedule and Arizona Game and Fish Department experience from past capture events. Please see the Environmental Assessment for further details on this analysis.

Of the three most common techniques used to capture desert bighorn sheep (*Ovis canadensis mexicana*), net gun capture from a helicopter generally causes fewer and lower-level stress physiological parameters, the lowest mortality rate, and the lowest combined morbidity and mortality rate. Only one of 137 (0.7%) bighorn sheep net-gun captured between 1983 and 1986 showed signs of capture myopathy, and two (1.5%) died of injuries (Jessup et al., 1988). Ongoing net gun capture efforts in Arizona continue to have a capture mortality rate below 1%.

The following design features were created to help minimize potential adverse effects to wilderness qualities:

- Captures would be scheduled for weekdays, but in the event weather conditions or equipment and personnel availability postpone or require quick response, helicopter flights and landings may occur on a weekend.
- When safe to do so and operationally feasible, flight paths would avoid trail corridors. When conducting capture activities care would be taken to avoid areas with high visitation.
- Nets that miss bighorn sheep would be collected to prevent adverse effects on wilderness character and or the safety of wildlife and visitors. The helicopters would land immediately after a bighorn sheep is netted, but the helicopter would not park (i.e. turn the engine off).
- Helicopters would land on bare ground whenever possible to avoid disturbing vegetation at the site.
- Bighorn sheep would be processed and fitted with collars outside of wilderness to avoid additional helicopter landing time in wilderness unless the intent of the capture is to release the bighorn sheep on site for monitoring purposes.
- All equipment including helicopter and nets would be inspected prior to use. Any weeds, seeds, or soil will be removed prior to the project activities.
- All fueling activities would occur outside wilderness areas and riparian areas.

Component Activities

How will each of the components of the action be performed under this alternative?

<u>Component of the Action</u>		Activity for this Alternative
X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Method of access to site	Access to the sites would be done by helicopter
2	Method of capturing sheep	The sheep are caught by net gun used from the helicopter
3	Method of processing and transporting sheep	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site
4	Conditions after capture	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed
5		
6		

7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Access to the sites would be done by helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	The sheep are caught by net gun used from the helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-1	NE
<u>Untrammeled Total Rating</u>		-1		

Explain:

This capture method may adversely affect the untrammeled quality of the wilderness because it manipulates and/or controls the natural processes or conditions. There would be minor, temporary, and site specific adverse effects on the untrammeled quality from bighorn sheep captures because the capture events would average one to three days within any given wilderness areas over a ten year period. The use of helicopters would be short-term and infrequent, and approximately 30 minutes at one capture location. Vegetation and other

natural characteristics within the wilderness will slightly be modified by rotor wash or helicopter skid marks on the landscape but are considered inconsequential effects to the untrammeled quality. There would be moderate, long-term, adverse effects to the untrammeled quality due to the removal of bighorn sheep from the Four Peaks and Superstition Wilderness because this activity would intervene in the free play of natural forces by manipulating the distribution of the bighorn sheep population. There would be minor, mid-term adverse effects to the untrammeled quality of the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas because captured bighorn sheep would display evidence of human control or manipulation (i.e. presence of VHF/GPS collars and ear tags).

UNDEVELOPED

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Access to the sites would be done by helicopter	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	The sheep are caught by net gun used from the helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-2	NE
<u>Undeveloped Total Rating</u>		-2		

Explain:

The use of the helicopter potentially effects the undeveloped character of the wilderness; however, this would be minor, temporary (one to three days annually) and site-specific due to the terrain of the wilderness where the bighorn sheep would be captured. Once the capture is completed, there would be no observable effects on the undeveloped quality because there would be no structures remaining on the ground or any lingering evidence of mechanized access to that location in the wilderness. The location of the landings would be widely

dispersed among each wilderness area during those years that captures occur. There would not be any moderate or major adverse effect on the undeveloped quality because there would not be any lingering effects such as permanent structures or facilities, nor human habitation of wilderness as part of the proposed project.

NATURAL

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Access to the sites would be done by helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	The sheep are caught by net gun used from the helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	-1	NE
<u>Natural Total Rating</u>		0		

Explain:

The proposed action may have positive and negative effects to the natural quality of wilderness. The major, long term beneficial effects to the natural quality of wilderness may be realized through reduction in bighorn sheep population in the Four Peaks and Superstition Wilderness Areas. As bighorn sheep herds within these wilderness areas increases, they expand their range outside wilderness into surrounding urban areas such as Gold Canyon or into the Heber-Reno domestic sheep driveway. The possibility of bighorn sheep coming into contact with domestic goats and sheep in these areas is a serious concern because of potential disease transmission from domestic animals to wild sheep. This may be the scenario that occurred in the mid-1990s when the bighorn population in the Four Peaks Wilderness was significantly reduced. The loss of these bighorn sheep herds from an epizootic event would significantly diminish the natural quality of wilderness character of

these areas. There would be minor, mid-term adverse effects to natural quality of the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas because captured bighorn sheep would display evidence of human control or manipulation (i.e. presence of VHF/GPS collars and ear tags).

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Access to the sites would be done by helicopter	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	The sheep are caught by net gun used from the helicopter	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	-4	NE
<u>Solitude or Primitive & Unconfined Rec. Total Rating</u>		-3		

Explain:

There would be moderate, temporary, and site-specific adverse effects on the outstanding opportunities for solitude or a primitive and unconfined type of recreation quality of wilderness because the noise and sight of the helicopters flying and landing would be disruptive to wilderness users. The helicopter use would be limited to approximately one to three days annually (no more than two days in any one wilderness area), with approximately six hours per day of flight time during the daylight hours as weather permits. All of the work would be scheduled for weekdays, but in the event weather conditions or equipment and personnel availability postpone or require quick response, helicopter flights and landings may occur on a weekend. These mitigation measures would minimize the impact on recreationists. The context of effects for each capture event will be site-specific, confined to the area around the helicopter activity within hearing distance by visitors and landings would occur during a time of year and in a location with very few visitors. Previous experiences from flying helicopter

surveys in these wilderness areas over the last 15 years indicates a very low probability of flying near a wilderness user in the steep and remote areas in which bighorn sheep occur. Trailheads and established trails would be avoided. There would be minor, mid-term adverse effects to solitude and primitive and unconfined recreation quality of the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas because captured bighorn sheep would display evidence of human control or manipulation (i.e. presence of VHF/GPS collars and ear tags) although it is expected to be inconsequential as most visitors would not observe bighorn sheep close enough to observe these markings. Observing bighorn sheep in these wilderness areas and those areas that bighorn sheep are reintroduced may contribute to the values of primitive recreation. Observing bighorn sheep is often described as a highlight of primitive recreational experiences. Successful reintroduction, augmentation, and monitoring of these populations may improve this recreational experience. Prior to 1980, bighorn sheep had been extirpated from the Four Peaks and Superstition Wilderness Areas. In 1980, reintroductions of bighorn sheep in these wilderness areas re-established the primitive recreation quality of observing sheep in their historic range as part of the natural component of these wilderness areas.

OTHER FEATURES OF VALUE

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Access to the sites would be done by helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	The sheep are caught by net gun used from the helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	0	NE
<u>Other Features of Value Total Rating</u>		1		

Explain:

Action is necessary to support one or more of the public purposes of wilderness (as stated in

Section 4(b) of the Wilderness Act) for recreation, scenic, scientific, education, conservation, and historical use. The overall effect would be positive for each of the public purposes of wilderness. Wildlife viewing and hunting are recreational activities linked to bighorn sheep occupation of these wilderness areas. A viable bighorn sheep population supports wildlife viewing and hunting opportunities along with scenic, scientific and educational purposes. Bighorn sheep have historically been a part of the natural component and qualities of these wilderness area ecosystems. The reestablishment and preservation of these natural components have occurred through conservation efforts involving reintroductions, augmentations and monitoring of bighorn sheep populations in the wilderness areas and prior to the establishment of some wilderness areas. With wild bighorn sheep populations utilizing habitats adjacent to domestic sheep and goats in urban areas and the Heber-Reno domestic sheep driveway, disease transmission is a serious concern. The current action would have an overall positive effect on conservation in wilderness. The Four Peaks, Hellsgate, Mazatzal, Salt River Canyon, and Superstition Wilderness Areas are considered historical bighorn sheep habitat. The Arizona Game And Fish Department has identified bighorn sheep reintroduction or population augmentation sites throughout the state of Arizona have been identified and evaluated as historical bighorn sheep habitat therefore having an overall positive effect on historical use.

Other Criteria

What is the effect of each component activity on other comparison criteria? What mitigation measures will be taken?

MAINTAINING TRADITIONAL SKILLS

Component Activity for this Alternative		Positive	Negative	No Effect
X	Example: Personnel will travel by horseback	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Access to the sites would be done by helicopter	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	The sheep are caught by net gun used from the helicopter	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-3	NE
<u>Maintaining Traditional Skills Total Rating</u>		-3		

Explain:

Allowing helicopters for transport of personnel, capturing bighorn sheep and landing in the wilderness may erode traditional skills.

SPECIAL PROVISIONS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Access to the sites would be done by helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	The sheep are caught by net gun used from the helicopter	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	0	NE
<u>Special Provisions Total Rating</u>		1		

Explain:

The proposed action to capture, release, translocate, monitor populations, and conduct research of bighorn sheep is compatible with Section 4 (d)(8) of the Wilderness Act and the role of the states in managing wildlife populations in wilderness.

ECONOMICS & TIME CONSTRAINTS

<u>Component Activity for this Alternative</u>	Positive	Negative	No Effect
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X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Access to the sites would be done by helicopter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The sheep are caught by net gun used from the helicopter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		4	0	NE
<u>Economics & Time Constraints Total Rating</u>		4		

Explain:

Bighorn sheep capture operations must be done during periods of appropriate temperatures, e.g. locally during winter months when, ambient temperatures are not too warm to ensure the physical well-being of captured sheep. Although helicopter flight-time is expensive (approximately \$1,000.00/hour), the efficiency of this type of capture makes it the preferred method in most situations. With the use of two helicopters flight time for capture is reduced by almost half, reducing capture operations to a one to three day event.

Safety of Visitors & Workers

What is the effect of each component activity on the safety of visitors and workers? What mitigation measures will be taken?

SAFETY OF VISITORS & WORKERS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Access to the sites would be done by helicopter	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	The sheep are caught by net gun used from the	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	helicopter			
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-3	NE
<u>Safety of Visitors & Workers Total Rating</u>		-3		

Explain:

Flying in helicopters is hazardous work and helicopter landings in wilderness have an inherent level of risk to personnel. However, all those working in the aircraft would have had extensive experience in such capture operations. Employees are required to wear appropriate personal protective equipment and there would be a safety briefing each time personnel board a helicopter. Two helicopters would be used primarily for safety reasons to assist either helicopter crew as needed. The helicopter would not land in areas where recreational activity is occurring. Helicopter landing locations are located safe distances from visitors and their vehicles. If visitors are present at the staging area, they are told the helicopter is coming in and are escorted to a safe distance while landing occurs and are not allowed back into the area until the helicopter is completely shut down. Visitors are not allowed to approach the helicopter at any time.

Summary Ratings for Alternative 1

<u>Wilderness Character</u>	
Untrammeled	-1
Undeveloped	-2
Natural	0
Solitude or Primitive & Unconfined Recreation	-3
Other Features of Value	1

Wilderness Character Summary Rating	-5
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<u>Other Criteria</u>	
Maintaining Traditional Skills	-3
Special Provisions	1
Economics & Time Constraints	4
Other Criteria Summary Rating	2

<u>Safety</u>	
Safety of Visitors & Workers	-3
Safety Summary Rating	-3

MRDG STEP 2: Alternative 2

Alternative 2: Drop Net Capture with use of Helicopters

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Drop-net captures involves catching groups of bighorn sheep by dropping a net on them after luring into a specific area. Supplies and equipment would be transported along roads adjacent to capture locations if available or by helicopter in wilderness areas.

A crew of ten to twenty-five people is needed to set up the drop-net station and conduct the capture. The crew may be present within each drop-net station area for a few days at a time while they set up the station and conduct the capture. At least three crew members would visit the drop-net station, daily, to observe bighorn activity and replace bait. The drop net station is established for approximately six weeks. Capture success is often dependent on bighorn sheep being concentrated in a specific area, either due to water or artificial feed. Usually, this is during the hottest time of the year (June-August) when bighorn sheep, if under stress, can be lured to water or feed. Carefully selecting the proper age and sex cohort of bighorns is not possible and stress and mortality rates to bighorn sheep are higher than helicopter net gun capture techniques. Baiting bighorn sheep to a specific site to place a drop net requires weeks and sometimes months of conditioning bighorn sheep to visiting a specific location for food.

The drop net capture area is approximately 20 feet by 20 feet. Some vegetation may be trimmed or removed to allow for nets to effectively capture bighorn sheep (i.e. nets completely touch the ground when released). Bait consists of hay, which would be certified weed-free. After bighorn are observed using the area, the net is suspended above the bait by poles. The crew then waits a few days more for the bighorn sheep to use the area again once they are used to the presence of the net. Once the crew determines the bighorn sheep are comfortable with the presence of the drop net station, the net is dropped on top of the bighorn sheep. Once caught in the net, the bighorn sheep would be restrained, health data collected, and then fitted with VHF and/or GPS collars and marked with numbered and colored ear tags. After processing the bighorn sheep would be released at the capture site or transported for translocation and all capture equipment would be taken down and removed from the site.

This constant activity and placement of a drop net would have relatively long-term adverse effects on several wilderness qualities. A road, use of helicopters, or some other means must still be used to transport the bighorn from the capture area for translocation captures.

Restricting capture operations to the drop net method would not meet the Arizona Game and Fish Department's objective to capture an adequate number of bighorn sheep and would not facilitate the need to capture the specific sex and age of bighorn sheep for bighorn sheep translocations.

Component Activities

How will each of the components of the action be performed under this alternative?

<u>Component of the Action</u>		Activity for this Alternative
X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Method of access to site	Personnel will travel by foot
2	Method of capturing sheep	Drop net from the ground
3	Method of processing and transporting sheep	A helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site
4	Conditions after capture	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed. Some vegetation trampling and removal would occur at the capture site.
5		
6		
7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Drop net from the ground	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	A helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	transport via helicopter or for release on site			
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed. Some vegetation trampling and removal would occur at the capture site.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-2	NE
<u>Untrammed Total Rating</u>		-2		

Explain:

Drop net capture may adversely affect the untrammed quality of the wilderness because it manipulates and/or controls the natural processes or conditions. These effects would be minor, temporary, and site specific. The drop net capture would require the helicopter to land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site and for transportation of equipment to and from the capture site. The capture efforts would be for one to six weeks in the hottest part of the summer (June-August). Bait would be used to manipulate the behavior and condition the bighorn sheep to concentrate near the artificial bait sites. There would be moderate, long-term adverse effects to the untrammed quality due to the removal of bighorn sheep from the Four Peaks and Superstition Wilderness because this activity would intervene in the free play of natural forces by manipulating the distribution of the bighorn sheep population. There would be minor, mid-term adverse effects to the untrammed quality of the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas because captured bighorn sheep would display evidence of human control or manipulation (i.e. presence of VHF/GPS collars and ear tags).

UNDEVELOPED

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Drop net from the ground	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed. Some vegetation trampling and removal would occur at the capture site.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-3	NE
<u>Undeveloped Total Rating</u>		-3		

Explain:

The use of the helicopter may adversely affect the undeveloped character of the wilderness; however, this would be temporary. This capture method would not involve any permanent physical developments or infrastructure but may have minor, temporary, short term, site specific adverse effects to undeveloped quality of wilderness from the development of the drop net site.

NATURAL

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Drop net from the ground	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed. Some vegetation trampling and removal would occur at the capture site.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	-2	NE
<u>Natural Total Rating</u>		-1		

Explain:

There would be temporary, short-term, site specific adverse effects on the natural quality of wilderness during the project and until the site vegetation recovers to its natural state. All vegetation other than grass or forbs must be removed from the drop net capture area. Net posts for the capture net must be set in the ground or secured with surrounding rocks and small boulders. The major, long term beneficial effects to the natural quality of wilderness may be realized through reduction in bighorn sheep population in the Four Peaks and Superstition Wilderness Areas although the Arizona Game and Fish Department would likely not be able to capture enough bighorn sheep using this method to realize this benefit. There would be minor, mid-term adverse effects to natural quality of the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas because captured bighorn sheep would display evidence of human control or manipulation (i.e. presence of VHF/GPS collars and ear tags).

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Drop net from the ground	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed. Some vegetation trampling and removal would occur at the capture site.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Total Number of Effects	1	-4	NE
<u>Solitude or Primitive & Unconfined Rec. Total Rating</u>	-3		

Explain:

During the duration of the project the area surrounding the drop net site area may have moderate, temporary, and site-specific adverse effects on the outstanding opportunities for solitude or a primitive and unconfined type of recreation quality of wilderness because the noise and sight of the helicopters flying and landing would be disruptive to wilderness users. With this method of capture the helicopter would land for approximately 30 minutes to process the bighorn sheep, multiple flights to remove bighorn sheep for translocation captures, and again for 30 minutes for transportation of equipment to and from the capture site. The capture site would have minor, site specific, short term adverse effects on recreation with a drop net structure and bait in place for up to several weeks because the drop net sites would be located in areas of the wilderness with little visitation during the months of July – August. There would be minor, mid-term adverse effects due to the number of personnel required to capture sheep with this method. Approximately 20-25 people are required and wilderness group size recommendation is no more than fifteen people according to wilderness implementation plans. There would be minor, mid-term adverse effects to solitude and primitive and unconfined recreation quality of the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas because captured bighorn sheep would display evidence of human control or manipulation (i.e. presence of VHF/GPS collars and ear tags) although it is expected to be inconsequential as most visitors would not observe bighorn sheep close enough to observe these markings. Observing bighorn sheep in these wilderness areas and those areas that bighorn sheep are reintroduced may contribute to the values of primitive recreation. Observing bighorn sheep is often described as a highlight of primitive recreational experiences. Successful reintroduction, augmentation, and monitoring of these populations may improve this recreational experience. Prior to 1980, bighorn sheep had been extirpated from the Four Peaks and Superstition Wilderness Areas. In 1980, reintroductions of bighorn sheep in these wilderness areas re-established the primitive recreation quality of observing sheep in their historic range as part of the natural component of these wilderness areas.

OTHER FEATURES OF VALUE

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Drop net from the ground	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed. Some vegetation trampling and removal would occur at the	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	capture site.			
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	0	NE
<u>Other Features of Value Total Rating</u>		1		

Explain:

Action is necessary to support one or more of the public purposes of wilderness (as stated in Section 4(b) of the Wilderness Act) for recreation, scenic, scientific, education, conservation, and historical use. The overall effect would be positive for each of the public purposes of wilderness. Wildlife viewing and hunting are recreational activities linked to bighorn sheep occupation of these wilderness areas. A viable bighorn sheep population supports wildlife viewing and hunting opportunities along with scenic, scientific and educational purposes. Bighorn sheep have historically been a part of the natural component and qualities of these wilderness area ecosystems. The reestablishment and preservation of these natural components have occurred through conservation efforts involving reintroductions, augmentations and monitoring of bighorn sheep populations in the wilderness areas and prior to the establishment of some wilderness areas. With wild sheep populations utilizing habitats adjacent to domestic sheep and goats in urban areas and the Heber-Reno domestic sheep driveway, disease transmission is a serious concern. The current action would have an overall positive effect on conservation in wilderness. The Four Peaks, Hellsgate, Mazatzal, Salt River Canyon, and Superstition Wilderness Areas are considered historical bighorn sheep habitat. The Arizona Game and Fish Department has identified bighorn sheep reintroduction or population augmentation sites throughout the state of Arizona as historical bighorn sheep habitat therefore having an overall positive effect on historical use.

Other Criteria

What is the effect of each component activity on other comparison criteria? What mitigation measures will be taken?

MAINTAINING TRADITIONAL SKILLS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2	Drop net from the ground	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed. Some vegetation trampling and removal would occur at the capture site.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	-2	NE
<u>Maintaining Traditional Skills Total Rating</u>		-1		

Explain:

Allowing helicopters for transport of equipment and landing to process bighorn sheep may erode traditional skills. Although access to the site by personnel is by foot, helicopters are used to transport the equipment and materials to the capture site. Arizona Game and Fish Department staff would maintain backpacking skills, Leave No Trace skills, and wilderness hiking and navigation skills.

SPECIAL PROVISIONS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Drop net from the ground	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed. Some vegetation trampling and removal would occur at the	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	capture site.			
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	-1	NE
<u>Special Provisions Total Rating</u>		0		

Explain:

The proposed action to capture, release, translocate, monitor populations, and conduct research of bighorn sheep is compatible with Section 4 (d)(8) of the Wilderness Act and the role of the states in managing wildlife populations in wilderness. There would be minor, mid-term adverse effects due to the number of personnel required to capture sheep with this method. Approximately 20-25 people are required and wilderness group size recommendation is no more than fifteen people according to wilderness implementation plans.

ECONOMICS & TIME CONSTRAINTS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Drop net from the ground	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed. Some vegetation trampling and removal would occur at the capture site.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	-3	NE
<u>Economics & Time Constraints Total Rating</u>		-2		

Explain:

Drop net captures require significant amounts of manpower and time. Between five and twenty individuals must be present for the capture to secure the drop net border and subdue bighorn sheep under the net. Once bighorn sheep become conditioned to moving under the drop net for bait, considerable time and effort can be wasted waiting for bighorn sheep to actually enter under the net, while personnel are on site for the capture. The use of the helicopter would facilitate removal of sheep for translocation in a timely manner but this method would not meet the Department's objective to capture an adequate number of bighorn sheep and would not facilitate the need to capture the specific sex and age of bighorn sheep for bighorn sheep translocations.

Safety of Visitors & Workers

What is the effect of each component activity on the safety of visitors and workers? What mitigation measures will be taken?

SAFETY OF VISITORS & WORKERS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Drop net from the ground	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	The helicopter would land for approximately 30 minutes to allow personnel to process the bighorn sheep for transport via helicopter or for release on site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed. Some vegetation trampling and removal would occur at the capture site.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Total Number of Effects	0	-2	NE
<u>Safety of Visitors & Workers Total Rating</u>	-2		

Explain:

Flying in helicopters is hazardous work and helicopter landings in wilderness have an inherent level of risk to personnel. This risk can be partially mitigated through training and following safety procedures. Mortality or injury to bighorn sheep utilizing the drop net is possible, but not considered significant. Personnel handling sheep under a drop net carries some risk with minor injuries. Accessing capture sites by foot through extremely remote and rugged terrain would be hazardous and can't be mitigated.

Summary Ratings for Alternative 2

<u>Wilderness Character</u>	
Untrammeled	-2
Undeveloped	-3
Natural	-1
Solitude or Primitive & Unconfined Recreation	-3
Other Features of Value	1
Wilderness Character Summary Rating	-8

<u>Other Criteria</u>	
Maintaining Traditional Skills	-1
Special Provisions	0
Economics & Time Constraints	-2
Other Criteria Summary Rating	-3

<u>Safety</u>	
Safety of Visitors & Workers	-2
Safety Summary Rating	-2

MRDG STEP 2: Alternative 3

Alternative 3: Immobilization Dart (Dart Gun) Capture

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Generally this capture method is associated with capturing individual animals for safety reasons or population specific information such as disease testing. It may not be feasible to reach remote areas of the wilderness because of rugged terrain and careful selection of the proper age and sex cohort of bighorn sheep may not be possible. Stress and mortality rates of bighorn sheep are generally higher with the use of immobilization drugs. The distance the animal moves after darting can be significant and hazardous, especially in bighorn sheep habitat. Generally, only one bighorn sheep can be captured at one time therefore the ability to capture multiple animals may take several weeks or months. This time would include time between locating the target animal, determining if that animal could be reached, and if immobilized, the time to transport each animal for recovery and release on site or for transport for translocation.

It would likely take several months to capture the annual desired number of (approximately 30 – 50) bighorn sheep using this method. This amount of activity in wilderness may contribute adversely to several wilderness qualities.

The inability to capture a significant number of bighorn sheep with this method would be a considerable burden to meeting the Arizona Game and Fish Department's sheep management objectives. Nonprofit groups interested in bighorn sheep management support statewide capture and translocation efforts through monetary contributions and volunteer labor. They expect the Arizona Game and Fish Department to use the most expeditious capture methods in accomplishing bighorn sheep management objectives.

Component Activities

How will each of the components of the action be performed under this alternative?

<u>Component of the Action</u>		Activity for this Alternative
X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Method of access to site	Personnel will travel by foot
2	Method of capturing sheep	Immobilization equipment (dart gun)
3	Method of processing and transporting	Personnel will carry sheep out on foot

	sheep	
4	Conditions after capture	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed
5		
6		
7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Immobilization equipment (dart gun)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Personnel will carry sheep out on foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-1	NE
Untrammeled Total Rating		-1		

Explain:

This capture method may negatively affect the untrammeled quality of the wilderness because it manipulates and/or controls the natural processes or conditions. There would be

moderate, long-term adverse effects to the untrammelled quality due to the removal of bighorn sheep from the Four Peaks and Superstition Wilderness because this activity would intervene in the free play of natural forces by manipulating the distribution of the bighorn sheep population. There would be minor, mid-term adverse effects to the untrammelled quality of the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas because captured bighorn sheep would display evidence of human control or manipulation (i.e. presence of VHF/GPS collars and ear tags).

UNDEVELOPED

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Immobilization equipment (dart gun)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Personnel will carry sheep out on foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Undeveloped Total Rating</u>		0		

Explain:

This method would have no effect on the undeveloped quality.

NATURAL

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Immobilization equipment (dart gun)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Personnel will carry sheep out on foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	-1	NE
Natural Total Rating		0		

Explain:

The proposed action may have positive and negative effects to the natural quality of wilderness. The major, long term beneficial effects to the natural quality of wilderness may be realized through reduction in bighorn sheep population in the Four Peaks and Superstition Wilderness Areas. As bighorn sheep herds within these wilderness areas increases, they expand their range outside wilderness into surrounding urban areas such as Gold Canyon or into the Heber-Reno domestic sheep driveway. The possibility of bighorn sheep coming into contact with domestic goats and sheep in these areas is a serious concern because of potential disease transmission from domestic animals to wild sheep. This may be the scenario that occurred in the mid-1990s when the bighorn population in the Four Peaks Wilderness was significantly reduced. The loss of these bighorn sheep herds from an epizootic event would significantly diminish the natural quality of wilderness character of these areas. There would be minor, mid-term adverse effects to natural quality of the Hellsgate, Mazatzal, and Salt River Canyon Wilderness Areas because captured bighorn sheep would display evidence of human control or manipulation (i.e. presence of VHF/GPS collars and ear tags).

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Immobilization equipment (dart gun)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Personnel will carry sheep out on foot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	-2	NE
<u>Solitude or Primitive & Unconfined Rec. Total Rating</u>		-1		

Explain:

Opportunities for solitude or primitive and unconfined recreation would be adversely affected by the scope and time to complete the project. This capture method could take several months that could adversely affect wilderness visitors.

OTHER FEATURES OF VALUE

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Immobilization equipment (dart gun)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Personnel will carry sheep out on foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Other Features of Value Total Rating</u>		0		

Explain:

This method would have no effect on other features of value.

Other Criteria

What is the effect of each component activity on other comparison criteria? What mitigation measures will be taken?

MAINTAINING TRADITIONAL SKILLS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Immobilization equipment (dart gun)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Personnel will carry sheep out on foot	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		2	0	NE
<u>Maintaining Traditional Skills Total Rating</u>		2		

Explain:

Travelling by foot and carrying sheep out on foot would have positive effects on maintaining traditional skills but would not meet project objectives.

SPECIAL PROVISIONS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Immobilization equipment (dart gun)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Personnel will carry sheep out on foot	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		1	0	NE
<u>Special Provisions Total Rating</u>		1		

Explain:

The proposed action to capture, release, translocate, monitor populations, and conduct research of bighorn sheep is compatible with Section 4 (d)(8) of the Wilderness Act and the role of the states in managing wildlife populations in wilderness.

ECONOMICS & TIME CONSTRAINTS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Immobilization equipment (dart gun)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Personnel will carry sheep out on foot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-3	NE
<u>Economics & Time Constraints Total Rating</u>		-3		

Explain:

Using immobilization dart capture technique to capture many animals over a large area would be a daunting, if not an impossible task. This capture method would not be practical due to the number of bighorn sheep needed for capture, rough terrain, extensive time to get to the captured animal, and significant disturbance to the area due to the time it would take to

complete the capture. This method requires more time capture personnel are in wilderness to locate animals over a longer period of time adversely affecting several wilderness qualities and personnel safety.

Safety of Visitors & Workers

What is the effect of each component activity on the safety of visitors and workers? What mitigation measures will be taken?

SAFETY OF VISITORS & WORKERS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	Personnel will travel by foot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Immobilization equipment (dart gun)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Personnel will carry sheep out on foot	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Selected bighorn sheep may be removed or released on site with VHF/GPS collar affixed	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-2	NE
<u>Safety of Visitors & Workers Total Rating</u>		-2		

Explain:

An immobilization dart capture would require extensive manpower and equipment in rugged and remote areas of the wilderness. This would increase the risk to human safety in the rugged and remote terrain and also add to the risk of mortality or injury to bighorn sheep.

Summary Ratings for Alternative 3

<u>Wilderness Character</u>	
Untrammeled	-1
Undeveloped	0

Natural	0
Solitude or Primitive & Unconfined Recreation	-1
Other Features of Value	0
Wilderness Character Summary Rating	-2

<u>Other Criteria</u>	
Maintaining Traditional Skills	2
Special Provisions	1
Economics & Time Constraints	-3
Other Criteria Summary Rating	0

<u>Safety</u>	
Safety of Visitors & Workers	-2
Safety Summary Rating	-2

MRDG STEP 2: Alternative 4

Alternative 4: No Capture

Description of the Alternative

What are the details of this alternative? When, where, and how will the action occur? What mitigation measures will be taken?

Under this alternative the capturing of bighorn sheep, by any method (motorized and non-motorized), for monitoring and translocations would not occur. All management efforts by the Arizona Game and Fish Department for the management of bighorn sheep in the project areas which include the capturing and handling of bighorn sheep would not occur.

This alternative would not be in compliance with laws, regulations, policies, and the public trust responsibility of the Arizona Game and Fish Department regarding management of wildlife. It would not meet the purpose and need for this project because placement of VHF and GPS collars for bighorn sheep population monitoring would not occur, augmentations of bighorn sheep would not occur, and reintroductions of bighorn sheep would not occur.

Governmental and non-governmental groups rely on the Department to meet public trust responsibilities to conserve, enhance, and restore Arizona's bighorn sheep populations through aggressive protection and management programs. Not capturing adequate numbers of bighorn sheep in wilderness areas hinders the Department's ability to manage bighorn sheep and would be of great concern to the general public.

As any wildlife population grows limiting factors can occur that keep populations at carrying capacity. From a wildlife management perspective, the most beneficial way to manage a big game population is to monitor and mitigate population growth. During a period of wildlife population growth removing a predetermined number of animals from a population can prevent or reduce the number of animals that can be lost to disease or reduced viability due to limited forage resources. Not capturing bighorn sheep from sheep populations in Game Management Units 22 (Four Peaks Wilderness) and 24B (Superstition Wilderness) may eventually lead to an undesirable epizootic outbreak.

Restoring bighorn sheep to their historic range and maintaining viable bighorn sheep populations would not be possible without conducting capture operations in these wilderness areas.

Component Activities

How will each of the components of the action be performed under this alternative?

<u>Component of the Action</u>	Activity for this Alternative
--------------------------------	-------------------------------

X	<i>Example: Transportation of personnel to the project site</i>	<i>Example: Personnel will travel by horseback</i>
1	Method of access to site	No action
2	Method of Capturing sheep	No action
3	Method of transporting sheep	No action
4	Conditions after capture	No action
5		
6		
7		
8		
9		

Wilderness Character

What is the effect of each component activity on the qualities of wilderness character? What mitigation measures will be taken?

UNTRAMMELED

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Untrammeled Total Rating</u>		0		

Explain:

There would be no effects to the untrammeled wilderness character.

UNDEVELOPED

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	0	NE
Undeveloped Total Rating		0		

Explain:

There would be no effects to the undeveloped wilderness character.

NATURAL

Component Activity for this Alternative		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No action	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-1	NE
<u>Natural Total Rating</u>		-1		

Explain:

There may be major, long term adverse effects on natural quality of wilderness through loss or decline in bighorn sheep populations. As bighorn sheep herds within this wilderness areas increase, they expand their range outside wilderness into surrounding urban areas such as the Gold Canyon area or into the Heber-Reno domestic sheep driveway. The possibility of bighorn sheep coming into contact with domestic goats and sheep in these areas is a serious concern because of the likelihood of disease transmission from domestic animals to wild sheep. Due to the observed and documented boom and bust cycles of bighorn sheep populations, no capture may eventually facilitate a decline in sheep populations due to an epizootic event. The loss of these bighorn sheep herds from an epizootic event would significantly diminish the natural quality of wilderness character of these areas.

SOLITUDE OR PRIMITIVE & UNCONFINED RECREATION

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No action	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-1	NE
<u>Solitude or Primitive & Unconfined Rec. Total Rating</u>		-1		

Explain:

Solitude or primitive and unconfined recreation would continue but likely diminish in quality as bighorn sheep populations may decline. Observing bighorn sheep in these wilderness areas

and those areas that bighorn sheep are reintroduced may contribute to the values of primitive recreation. Observing bighorn sheep is often described as a highlight of primitive recreational experiences. Successful reintroduction, augmentation, and monitoring of these populations may improve this recreational experience.

OTHER FEATURES OF VALUE

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No action	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-1	NE
<u>Other Features of Value Total Rating</u>		-1		

Explain:

Action is necessary to support one or more of the public purposes of wilderness (as stated in Section 4(b) of the Wilderness Act) for recreation, scenic, scientific, education, conservation, and historical use. No action may have a major, long term, adverse effect on conservation in wilderness. The Four Peaks, Hellsgate, Mazatzal, Salt River Canyon, and Superstition Wilderness Areas are considered historical bighorn sheep habitat.

Other Criteria

What is the effect of each component activity on other comparison criteria? What mitigation measures will be taken?

MAINTAINING TRADITIONAL SKILLS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Maintaining Traditional Skills Total Rating</u>		0		

Explain:

Traditional skills in wilderness would not be affected with no action.

SPECIAL PROVISIONS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Special Provisions Total Rating</u>		0		

Explain:

No effect

ECONOMICS & TIME CONSTRAINTS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	No action	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	No action	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	No action	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	No action	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	-4	NE
<u>Economics & Time Constraints Total Rating</u>		-4		

Explain:

This alternative would have major, long term adverse effects to economics and time constraints related to bighorn sheep management in Arizona. A significant amount of planning, coordination and funding is required to meet the Arizona Game and Fish Department's statewide sheep management objectives and to meet public trust responsibilities to conserve, enhance, and restore Arizona's bighorn sheep populations. Funding is secured and dedicated in advance of the projects through a variety of sources including state funding, federal funding, public and private donations, non-governmental organizations and others depending on the project. With dedicated funds and limited populations of bighorn sheep to utilize as source populations for translocations, project implementation timeframes can be narrow.

Safety of Visitors & Workers

What is the effect of each component activity on the safety of visitors and workers? What mitigation measures will be taken?

SAFETY OF VISITORS & WORKERS

<u>Component Activity for this Alternative</u>		Positive	Negative	No Effect
X	<i>Example: Personnel will travel by horseback</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	No action	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total Number of Effects		0	0	NE
<u>Safety of Visitors & Workers Total Rating</u>		0		

Explain:

Safest alternative (Alternative 4 / No Action), but does not meet the objectives of the project.

Summary Ratings for Alternative 4

<u>Wilderness Character</u>	
Untrammeled	0
Undeveloped	0
Natural	-1
Solitude or Primitive & Unconfined Recreation	-1
Other Features of Value	-1
Wilderness Character Summary Rating	-3

<u>Other Criteria</u>	
Maintaining Traditional Skills	0
Special Provisions	0
Economics & Time Constraints	-4
Other Criteria Summary Rating	-4

<u>Safety</u>	
Safety of Visitors & Workers	0
Safety Summary Rating	0

MRDG STEP 2: Alternative Comparison

Alternative 1:	Net gun Capture with Helicopters
Alternative 2:	Drop Net Capture with the use of Helicopters
Alternative 3:	Immobilization Dart (Dart Gun) Capture
Alternative 4:	No Capture

Wilderness Character	Alt 1		Alt 2		Alt 3		Alt 4	
	+	-	+	-	+	-	+	-
Untrammeled	0	-1	0	-2	0	-1	0	0
Undeveloped	0	-2	0	-3	0	0	0	0
Natural	1	-1	1	-2	1	-1	0	-1
Solitude or Primitive & Unconfined Rec.	1	-4	1	-4	1	-2	0	-1
Other Features of Value	1	0	1	0	0	0	0	-1
Total Number of Effects	3	-8	3	-11	2	-4	0	-3
Wilderness Character Rating	-5		-8		-2		-3	

Other Criteria	Alt 1		Alt 2		Alt 3		Alt 4	
	+	-	+	-	+	-	+	-
Maintaining Traditional Skills	0	-3	1	-2	2	0	0	0
Special Provisions	1	0	1	-1	1	0	0	0
Economics & Time Constraints	4	0	1	-3	0	-3	0	-4
Total Number of Effects	5	-3	3	-6	3	-3	0	-4
Other Criteria Rating	2		-3		0		-4	

Safety	Alt 1		Alt 2		Alt 3		Alt 4	
	+	-	+	-	+	-	+	-
Safety of Visitors & Workers	0	-3	0	-2	0	-2	0	0
Safety Rating	-3		-2		-2		0	

MRDG STEP 2: Alternatives Not Analyzed

Alternatives Not Analyzed

What alternatives were considered by not analyzed? Why were they not analyzed?

Drive-net:

Drive net captures involve capturing groups of bighorn sheep by driving them into a net using a helicopter. A crew of ten to twenty-five people is needed to set up the drive net station. Helicopter landings are not required because all animal handling is performed by the ground crew. The helicopter is used solely to drive the bighorn into the drive net at the capture site.

The drive net capture area is approximately 40 feet by 40 feet and can be linear in shape, angled, or shaped like a corral, depending on terrain. Some vegetation may be trimmed or removed to allow for nets to effectively capture bighorn sheep. Nets are generally placed on the lee-side of small ridges or hills where they are out of sight from the bighorn being driven into the net. Once caught in the net, the bighorn sheep would be restrained; health data collected, and then fitted VHF and/or GPS collars and marked with numbered and colored ear tags. After processing, the bighorn sheep will be released at the capture site or transported for translocation and all capture equipment would be taken down and removed from the site.

Unfortunately, the terrain in which bighorn sheep occupy within and adjacent to these wilderness areas is not conducive to this capture method. Generally this capture method is used in relatively flat and open terrain. Furthermore, the equipment used during the capture requires a moderate level of ground disturbance with posts and subsequent trampling of vegetation by crew members and captured bighorn sheep.

MRDG STEP 2: Decision

Refer to the [MRDG Instructions](#) before identifying the selected alternative and explaining the rationale for the selection.

Selected Alternative

<input checked="" type="checkbox"/>	Alternative 1:	Net gun Capture with Helicopters
<input type="checkbox"/>	Alternative 2:	Drop Net Capture with Helicopters
<input type="checkbox"/>	Alternative 3:	Immobilization Dart Capture
<input type="checkbox"/>	Alternative 4:	No Capture
<input type="checkbox"/>	Alternative 5:	
<input type="checkbox"/>	Alternative 6:	
<input type="checkbox"/>	Alternative 7:	
<input type="checkbox"/>	Alternative 8:	

Explain Rationale for Selection:

1. The majority of bighorn sheep in the proposed project area are located within or on the edges of the Four Peaks, Hellsgate, Mazatzal, Superstition, and Salt River Canyon Wilderness Areas. Capturing bighorn sheep in these remote areas with net guns from helicopters is the most effective alternative with the minimum activity. Bighorn sheep captures utilizing helicopters in this topography generally result in lower stress levels on bighorn sheep and subsequently the lowest mortality rate of bighorn sheep when compared to other capture methods. With narrow seasonal timeframes to capture bighorn sheep, utilizing helicopters is the most efficient capture method in regards to bighorn sheep health, economics, and personnel. Utilizing two helicopters reduces the capture to approximately one to three days with minimal disturbance to wilderness qualities.
2. Meets FSM Policy 2326.1 for conditions under which mechanical transport in wilderness may be used: “an essential activity which is impossible to accomplish by non-motorized means because of such factors as time or season limitations, safety, or other material restrictions.” Non-motorized means may be considered “impossible” due to inaccessible terrain and extreme seasonal temperatures.
3. Helicopter captures would be consistent with the FSM 2323.32 by applying the 2006 IAFWA MOU pertaining to fish and wildlife research and management surveys in wilderness. This MRDG conforms to the analysis needed to approve helicopter landings in wilderness.
4. Meets FSM Policy 2323.37 that allows research methods that temporarily infringe on the wilderness character, provided the information sought is essential for wilderness management and alternative methods or locations are not available. Although alternative methods are available, this MRDG analysis concluded the other alternative considered would not meet the Arizona Game and Fish Department’s objectives for bighorn sheep

management.

5. The adverse effects to wilderness qualities described in this MRDG would be outweighed by the long term beneficial effects to the bighorn sheep populations both in these wildernesses and throughout the state of Arizona.
6. This alternative requires the shortest amount of time (reducing adverse effects to wilderness qualities) and allows project objectives and recovery goals to be accomplished.

Mitigation for Helicopter Landings in Wilderness:

1. Captures will be scheduled for weekdays, but in the event weather conditions or equipment and personnel availability postpone or require quick response, helicopter flights and landings may occur on a weekend. In order to minimize potential conflicts with wilderness character caused by the sound of helicopters in wilderness and helicopter landings in wilderness, all efforts will be taken to reduce capture events on the weekends.
2. The Department would contact the Tonto National Forest prior to any project that may involve helicopter landings.
3. The Department would first attempt to retrieve any VHF/GPS collars by ground prior to landing a helicopter in wilderness.
4. Helicopter landings inside wilderness will be approximately 30 minutes per site.
5. Flight paths will avoid any endangered, threatened, or sensitive species habitat (e.g. Mexican Spotted Owl Protected Activity Center)
6. When safe and operationally feasible, flight paths will avoid trail corridors.
7. All helicopter activities would be managed by the Arizona Game and Fish Department.
8. Helicopter activity should be limited in Salt River Canyon Wilderness during river rafting season (March 1 – May 15) unless exigent circumstances warrant otherwise.

Describe Monitoring & Reporting Requirements:

1. The Department will annually provide locations of helicopter landings in wilderness to the Tonto National Forest. The Tonto National Forest will record landing in the INFRA database (landing dates, locations, and number of landings per day).
2. The Department will provide the Tonto National Forest a summary report of project activities involving helicopter landings in wilderness.

Approval of Prohibited Uses

Which of the prohibited uses found in Section 4(c) of the Wilderness Act are approved in the selected alternative and for what quantity?

<input checked="" type="checkbox"/>	Mechanical Transport:	Two helicopters and associated capture equipment/personnel
<input checked="" type="checkbox"/>	Motorized Equipment:	Two helicopters and associated capture equipment/personnel
<input type="checkbox"/>	Motor Vehicles:	
<input type="checkbox"/>	Motorboats:	

<input checked="" type="checkbox"/>	Landing of Aircraft:	Two helicopters and associated capture equipment/personnel
<input type="checkbox"/>	Temporary Roads:	
<input type="checkbox"/>	Structures:	
<input type="checkbox"/>	Installations:	

Record and report any authorizations of Wilderness Act Section 4(c) prohibited uses according to agency policies or guidance.

Refer to agency policies for the following review and decision authorities:

Prepared	Name	Position	
	John Dickson	Arizona Game and Fish Department Wildlife Manager III	
	Signature		Date
			09/18/2014

Recommended	Name	Position	
	Signature		Date

Recommended	Name	Position	
	Signature		Date

Approved	Name	Position	
	Signature		Date